

CLAIMS

1. A display device comprising:
a first array of individual display elements; and
a second array of control transistors for the display elements, wherein the control
transistors include a semiconductor material with a band gap sufficiently large to be
transparent in the visible spectral range.

2. The display device of claim 1, wherein the display elements include organic
light-emitting elements.

3. The display device of claim 2, wherein the organic light-emitting elements
include a layer sequence having a cathode, an electron transport layer, an organic light-
emitting layer, a hole transport layer and an anode.

4. The display device of claim 1, wherein the display elements include liquid
crystal elements.

5. The display device of claim 1, wherein the band gap of the semiconductor
material of the control transistors is larger than 3 eV.

6. The display device of claim 1, wherein the semiconductor material of the
control transistors includes one or more of: BN, Ga(In,Al)N, ZnO, a II-VI semiconductor,
SiC and diamond.

7. The display device of claim 1, wherein the control transistors are formed in
one or more thin layers of the semiconductor material.

8. The display device of claim 7, wherein a thin layer of the semiconductor
material has a layer thickness in the range of approximately 0.5 μm to approximately 20 μm .

9. The display device of claim 1, wherein the array of display elements contains multiple sub-arrays, the display elements of each sub-array being designed and configured for showing various colors.

5 10. The display device of claim 9, wherein the array of display elements contains three sub-arrays, wherein the display elements of each sub-array is designed and configured for showing red, green and blue.

10 11. The display device of claim 9, wherein the multiple sub-arrays are disposed in the same plane on a carrier substrate.

12. The display device of claim 9, wherein the multiple sub-arrays are disposed in stacked layers in multiple planes.

15 13. The display device of claim 12, wherein each of the multiple sub-arrays is disposed on its own carrier substrate.

14. The display device of claim 13, wherein the carrier substrate is a glass plate.

20 15. The display device of claim 1, wherein each control transistor controls exactly one of the individual display elements.

16. The display device of claim 1, wherein each control transistor controls several of the individual display elements.

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17. A method for manufacturing a display device, comprising:
applying a layer of a semiconductor material having a band gap sufficiently large to be transparent in the visible spectral range to a transparent carrier;

30 processing the layer on the transparent carrier to provide structures for control transistors; and

applying an amorphous light-emitting material to the control transistors to form the display elements.

18. The method of claim 17, wherein the amorphous light-emitting material
5 comprises an organic material for organic light emitting diodes.

19. The method of claim 17, wherein the transparent carrier is a glass carrier.

20. A method for manufacturing a display device, comprising:
10 producing a layer of a semiconductor material having a band gap sufficiently large to be transparent in the visible spectral range;
processing the thin layer to provide structures for control transistors;
applying the processed thin layer to a transparent carrier; and
applying an amorphous light-emitting material to the control transistors to form the
15 display elements.

21. The method of claim 20, wherein the amorphous light-emitting material comprises an organic material for organic light emitting diodes.

20 22. The method of claim 20, wherein the transparent carrier is a glass carrier.

23. The method of claim 20, further comprising:
producing the display elements for different colors with corresponding control transistors, each display element being disposed on a transparent carrier; and
25 adjusting the transparent carriers with the display elements relative to one another.

24. The method of claim 23, wherein the transparent carrier is a glass carrier.

25. The method of claim 23, wherein the display elements are produced for red,
30 green, and blue.

26. The method of claim 21, further comprising:
producing the display elements for different colors with corresponding control transistors, using planarizing technology to directly and vertically stack the elements on a shared transparent carrier.

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27. The method of claim 26, wherein the transparent carrier is a glass carrier.

28. The method of claim 26, wherein the display elements are produced for red, green, and blue.